kindest of men, unassuming to a fault, with a cordial detestation of everything false, presumptuous or sordid. His cheery, youthful manner and lively conversation endeared him to many, even of those who had not the privilege of seeing the deep sympathetic nature beneath.

## NOTES.

AN extra meeting of the Chemical Society will be held in the theatre of the Royal Institution on Friday, October 18, at 9 p.m., when Prof. Emil Fischer, F.R.S., will deliver the Faraday lecture, entitled "Organic Synthesis and its Relation to Biology."

THE honorary secretary of the Hampstead Scientific Society informs us that, by permission of the London County Council, a meteorological station (in connection with the Meteorological Office and the British Rainfall Organisation, Camden Square) is to be established by the society at the flagstaff on the summit of Hampstead Hill. This being the highest point in the neighbourhood of London, some interesting records should be obtained. A small astronomical observatory is also to be placed at the same spot, which it is hoped may be of educational value to students and senior pupils of London County Council schools.

THE British military airship travelled on Saturday last from Aldershot to London at the rate of about twenty-four miles an hour, and after circling round St. Paul's Cathedral, headed against the wind on the return journey. Owing to the strong wind prevailing, the descent was made in the grounds of the Crystal Palace at Sydenham. The total distance covered was fifty miles, and the mean altitude was 750 feet.

AN exhibition is to be held at the Royal Horticultural Hall, Vincent Square, Westminster, on October 22–26, in connection with the *Model Engineer*, and will include a collection of engineering models of all kinds; electrical, optical, and scientific instruments; technical education apparatus; and lathes, tools, and workshop appliances. Popular scientific lectures and demonstrations will be given each day, and many of the models will be shown at work.

MR. F. WOOD-JONES, Harley Lodge, Enfield, informs us that on November 15, 1905, he set adrift several bottles from the Cocos-Keeling atoll, Indian Ocean (12° 04′ 24″ S., 95° 55′ 19″ E.), containing messages requesting that the finder would let him know the place and time of finding. On May 27, 1906, one was picked up on the coast of Brara, Italian Somaliland (1° 06′ 08″ N., 44° 01′ 52″ E.), and on July 11, 1907, another turned up at exactly the same spot. These facts point to a constant westward current in this part of the Indian Ocean. For both communications Mr. Wood-Jones is indebted to Captain Resident G. Piazza, of Italian Somaliland.

THE death is reported on September 22 of Prof. W. O. Atwater, of the Wesleyan University, Middletown, Connecticut. He directed from 1875 to 1877 the Connecticut Agricultural Experiment Station, the first institution of the kind in the United States. In 1888 he founded the experiment station of the Federal Department of Agriculture. Of late years he had directed the special investigations of that department into questions of nutrition. He was joint inventor of the Atwater-Rosa calorimeter for experiments on the metabolic changes going on in the human body; and was the author of a large number of articles and reports on physiological and agricultural chemistry. Prof. Atwater, who was sixty-three years of age, had been practically helpless since he suffered from a stroke of apoplexy two years ago.

NEWS has been received from Dr. Sven Hedin by the Simla correspondent of the *Pioneer Mail*, the communication being dated July 25, from the Mansarowar Lake. Dr. Hedin reports that this last journey from Shigatse to Tok-chen, on the lake, has been richer in results than his previous one from the Aksai Chin to Shigatse, as he has been almost the whole time in inhabited country. His message, of which the following is an extract, appears in the *Pioneer Mail* of September 20:—"The results are 1300 big pages in annotations, 203 sheets of maps, 410 specimens of rock in connection with geological profiles, 700 panoramas, twenty-six astronomical points, the meteorological journal continued three times a day, and passes and camps fixed by boiling-point thermometer; at every river crossing a detailed measurement of the volume of water—the Brahmaputra—has been measured at seven points, and most of the northern tributaries, as well as some of the southern; a collection of plants; a great number of sketches, especially types, the interior of temples, and landscape sceneries. One lake, Amtchok-Tso, has been carefully measured, and an isobathic map made. The height of many peaks has been measured with the theodolite at a couple of places; the height of old beach lines of lakes has been measured."

AN appeal for funds to secure the preservation of the "Sarsen Stones" on the Marlborough Downs known as the "Grey Wethers" has been issued jointly by the National Trust for Places of Historic Interest or Natural Beauty, the Wiltshire Archæological and Natural History Society, and the Marlborough College Natural History Society. These sarsen stones are, geologically, the hardened and solidified boulders of a stratum of Eocene sand formerly covering the chalk, which in the course of ages has been denuded of the softer portions. The stones vary in size from small boulders to masses of sixty or seventy tons. For many generations these stones, scattered widely over the downs, have been broken up and used for building and other purposes, mainly of a local character. As there is every probability that the work of breaking up the sarsens will be undertaken soon on a greatly extended scale, an attempt is being made to secure the preservation of some characteristic examples of the stones in their natural condition. The sum of about 500*l.* is asked for in order to purchase about twenty acres of land where there are many of the stones. If the money is forthcoming, characteristic examples of a unique geological phenomenon will be secured for the nation. The donations already received or promised amount to 164*l.* Subscriptions to the fund may be sent to Mr. E. Meyrick, F.R.S., Thornhanger, Marlborough, or to Mr. Nigel Bond, secretary, the National Trust, 25 Victoria Street, Westminster, S.W.

TO *Spolia Zeylanica* for August Mr. J. Llewellen Thomas contributes further particulars on hybridising the Ceylon jungle-fowl (*Gallus stanleyi*), a subject on which a note appeared in our columns last year. The new experiments demonstrate that in certain circumstances the hybrids with domesticated fowls are fertile, both *inter se* and with their parents, and under really favourable conditions it is surmised that complete fertility could be established. This being so, Darwin's argument from the infertility of the hybrids that *Gallus stanleyi* cannot be the parent stock of domesticated poultry no longer holds good. The difficulty, however, is to convert this negative evidence



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into positive proof that the Ceylon jungle-fowl is entitled to occupy that position. An important point in the case is the fact that when domesticated fowls tend to revert to the wild type, the cocks develop red or brown (never black) breasts. As the Indian *Gallus bankiva* is black-breasted, the reversion is thus in the direction of the Ceylonese species, which has a reddish-brown breast in the males.

IT is a well-known fact that many lizards inflate the body, the region of the mouth, or special laryngeal sacs, for the apparent purpose either of frightening enemies or as a means of sexual attraction, or perhaps for both together. Examples of this are displayed by the inflation of the body in Lacerta and Phrynosoma, in the expansion of the frills of Chlamydosaurus, and the dilatation of the gular sacs of Metopoceros and other iguanas. Such effects might be enhanced, it is reasonable to suppose, by a swelling-out of the head and protrusion of the eyes. Such a function, according to Dr. H. L. Bruner in the *American Journal of Anatomy*, vol. vii., pp. 1–117, is, however, insufficient to explain the existence in the heads of both sexes of many lizards and snakes of an apparatus of muscles and vascular sinuses for producing excessive blood-pressure, and consequent swelling in this region. In lizards, at any rate, this mechanism is developed for the purpose of aiding in the shedding of the scales, and acts physiologically by accelerating lymph movements, and thus promoting metabolism, and mechanically by stretching the skin over the soft parts. This being so, the probability is that the same factor holds good in the case of snakes and tortoises. In some instances, however, the function may be modified for terrifying or sexual purposes, and it is probable that the ejection of blood from the eyes of the "horned toads" (Phrynosoma) is a special development of the same mechanism.

A GREEK pamphlet lately published at Athens (P. D. Sacellarius) under the title of "*Αἱ τῶν* Lamarck *καὶ* Darwin *Θεωρίαι παρὰ τῷ Ἀριστοτέλει*," gives an interesting account of various passages in the works of Aristotle which contain anticipations of modern observations and discoveries. The existence of a placenta in selachians and the sexual dimorphism of certain cephalopods were among the facts well known to the Greek philosopher, who also shows a considerable grasp of the phenomena of correlation, of the influence of external conditions on individual development, and of the rivalry between organisms in which the weakest goes to the wall. It is, however, rightly pointed out that Aristotle, though he had distinctly before his mind the principle of natural selection as propounded by Empedocles, deliberately rejected that principle as a factor in organic evolution. A passage from the "Physics," frequently quoted and almost as frequently misinterpreted, shows conclusively that Aristotle, though no theist, held firmly to the view that the scheme of nature is purposeful and rational; but adaptations, in his opinion, came into existence ready-made, and not by degrees. The difference between this latter position and that of Darwin is clearly emphasised in the present pamphlet, but even here the force of the argument in the passage we allude to does not seem to have been fully realised.

WE have received a reprint of the memoir (*Biometrika*, vol. v., part iii.) by Mr. J. F. Tocher on the anthropometric characteristics of the inmates of asylums in Scotland, based on data collected by a survey organised by Mr. Tocher under the Henderson Trust of Edinburgh. The characters observed and recorded were stature, head length, head breadth, and head height, hair colour, eye colour, and nose contour. The data are discussed very fully by Mr. Tocher, with especial reference to the methods of Prof. Karl Pearson; to those not familiar with his methods the memoir will prove somewhat difficult reading, the more so as Prof. Pearson's symbols are frequently used without definition. It is impossible to compare the measured characteristics with those of the sane, since no such survey of the sane population has yet been carried out; as regards hair and eye colour, however, comparisons can be made with the results of a survey of school children, and it appears that the sane and insane differ significantly, the latter being lighter eyed and darker haired than the sane population. The majority of the frequency distributions for measured characters are skew, but not more so than similar distributions, drawn from other sources, for the same characters of sane populations. The whole of the original individual data and measurements, concerning 4381 males and 3925 females, together with correlation tables, are given in an appendix.

THE publications of the Natural History Section of the Indian Museum, Calcutta, will in future consist of Memoirs, to be issued periodically, and of Records, which will contain shorter papers on zoology and the allied branches of anthropology, and will be issued, so far as possible quarterly. The first two numbers of the Records contain many contributions of interest. Captain Lloyd describes a collection of the fauna of the Arabian Sea, which was made in the course of a voyage by the Indian survey ship *Investigator* between Aden and Muscat. Considering that this is new ground, the results are disappointing, only a small number of new specimens having been obtained; but the repeated recurrence of many of the species at different stations is remarkable, and the appearance of the giant isopod, *Bathynomus giganteus*, and the large bilaterally symmetrical hydroid, *Branchiocerianthus imperator* (here recorded for the first time in the Indian seas), is noteworthy. Mr. C. A. Paiva discusses the Hemiptera and Hymenoptera of the Himalayas, and Dr. Annandale, with the assistance of the Rev. T. R. R. Stebbing, continues his reports on the fauna of the brackish pools at Port Canning, to which Mr. R. Gurney adds some further notes on Indian freshwater Entomostraca. In part ii. the most elaborate papers are that of Mr. E. Brunetti on the revision of the Oriental Stratiomyidæ, and a report on a new large collection of batrachia, reptiles, and fish from Nepal and the Western Himalayas, by Mr. Boulenger, Dr. Annandale, and Mr. Regan. It is not difficult to explain the prevalence of malarial fever in Bengal when we learn that Mr. Chatterjee found within three hours no fewer than 250 specimens of the Anopheles mosquito in the rest-house at Port Canning. It has been suggested that this pest might be destroyed by admitting sea-water into the pools occupied by them; but while there are recorded instances of mosquito larvæ being found in salt water, it has now been ascertained that the brackish pools at Port Canning contain an abundant supply. Here at least petroleum is likely to hold its ground as a remedy.

A PRACTICAL article on pruning cocoa is contributed by Mr. W. Cradwick to the Bulletin of the Department of Agriculture, Jamaica (June and July), and the diagnoses of two new species of Comocladia are furnished by Dr. N. L. Britton. The report prepared by Mr. F. Stockdale



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on cocoa-nut diseases in Trinidad, describing a root disease referred to a fungus Botryodiplodia, a leaf disease caused by a Pestalozzia, and a bud-rot disease, is also published.

THE third part of the first volume of the Proceedings of the Association of Economic Biologists is devoted to the papers presented at the meeting of the society held in Cambridge in January. The majority of the papers are represented by abstract or title, but the paper by Mr. E. S. Salmon on the American gooseberry-mildew is printed at length. The author refers to the spread of the disease, and its prevalence in parts of Worcestershire, where the County Council has been taking measures to stamp it out; also he points out the necessity for establishing a sub-department of the Board of Agriculture to look after the fruit industry.

THE latest number of the entomological series of Memoirs of the Department of Agriculture in India (vol. i., No. 5), for which Mr. E. E. Green and Dr. H. H. Mann are conjointly responsible, is devoted to the Coccidæ attacking the tea plant in India and Ceylon. Although thirty species are enumerated, only two or three have so far proved serious pests, but it is stated that with Coccidæ, even more than other phytophagous insects, every species must be regarded as a potential enemy, since, owing to some unforeseen change, dangerous multiplication may ensue. Two new species, *Chionaspis manni, Dactylopius theaecola*, and a new variety of *Tachardia decorella* are described.

COMMISSIONED by the New Zealand Government to undertake a botanical survey of the small island of Kapiti, situated in Cook Straits, Dr. L. Cockayne has compiled a highly interesting report describing the various plant formations, and enumerating the indigenous ferns and flowering plants. It is proposed to conserve the island as a sanctuary for native birds and plants, especially for species that are becoming rare. As a shelter for birds, and from an ecological standpoint, the forests are alike important. *Corynocarpus laevigata, Dysoxylum spectabile, Macropiper excelsum, Myoporum laetum*, and *Melicytus ramiflorus* are conspicuous trees. The northern rata, *Metrosideros robusta*, varies greatly, sometimes throwing out arches composed of aërial roots. Other species of Metrosideres generally form lianes, and among them *Metrosideros scandens*, but when growing in the open it assumes a shrubby habit. Allusion is also made to the marked heterophylly of *Lomaria filiformis*, to the cauliflory or production of flowers on the naked stems of several trees, and to many other interesting ecological features.

UNDER the title "Ombre sismiche e rimbalzi sismici," Prof. V. Monti has issued a pamphlet dealing with the phenomenon known as earthquake shadow. He finds that Mount Etna appears to have a protective effect in the case of earthquakes in Sicily, and that, wherever the focus may be situated, places lying on the further side of the mountain do not feel the shock, though others at a greater distance are shaken. Monte Cimone, in northern Italy, seems to exercise a similar protective effect, but the much higher range of the Gran Sasso d'Italia and Maiella has no influence of this nature. He rejects the explanation suggested by Prof. Rizzo in his study of the Calabrian earthquake of September 8, 1905, but offers none in its stead. We may remark that the term shadow is based on the supposition that earthquakes originate in areas of small dimensions compared to that over which they are felt; the term loses its significance if Major Harboe's suggestion of extended origins, noticed in NATURE of April 26, 1906, is accepted.

THE U.S. *Monthly Weather Review* for May contains a full translation, by Dr. O. L. Fassig, research director of Mount Weather Observatory, of M. G. Guilbert's principles of forecasting the weather, submitted to the international competition at Liége, organised in 1905 by the Belgian Astronomical Society, with the view of showing the state of our knowledge of that subject. The jury, which was composed of six well-known meteorologists, unanimously awarded the first prize to M. Guilbert, of Caen, whose forecasts were based upon conclusions drawn from the study of the relation of the theoretical to the actual wind. He claims to be able to predict with precision the displacements and variations of centres of high and low pressure for twenty-four hours in advance, and to foretell the inception and dissolution of storms. Dr. Fassig points out that the rules can readily be put to test, and that the paper should receive the careful consideration of all who make weather forecasts. The subject is referred to in the last Parliamentary Report of the Meteorological Committee, and a valuable discussion of the principles will be found in the *Archives des Sciences* for July, 1906, by M. Brunhes, chairman of the jury of award.

*Science* for August 30 contains the presidential address of Mr. F. T. Shutt to the section of agricultural chemistry at the meeting of the American Chemical Society held this summer in Toronto. Mr. Shutt's address deals mainly with the virgin soils of the new north-west, showing by analysis their richness in nitrogen, but pointing out how rapidly they become exhausted under the common system of growing successive wheat crops with an occasional bare fallow. He gives figures to show that twenty years of such cultivation has reduced the nitrogen content of the soil down to the depth of 8 inches by no less than 2206 lb. per acre, of which not more than 700 lb. has been obtained in the crop. Although no marked falling off in the yield of this soil is as yet apparent under proper cultivation, chemistry warns the cultivator that a great drop in fertility must inevitably take place unless something is done to replenish the nitrogen. This, Mr. Shutt points out, can be done by the growth of clover, and gives examples of the enrichment of the soil consequent upon the introduction of this crop.

MR. CHARLES A. CULVER, of the University of Pennsylvania, has undertaken a study of the relative efficiencies of the various types of receiving systems in use in wireless telegraphy, and the *Physical Review* for September contains an account of the first part of his investigations. Of the types tested, those consisting of one or more vertical wires are the most efficient, and it seems immaterial whether the component parts are connected together at the lower, upper, or both ends. Partial screening of the aërial produces little effect, while the resistance of the earth between the sending and receiving stations is of prime importance. From a consideration of his own results and those of others, Mr. Culver concludes that the theory of propagation of the waves through the surface of the earth accounts for more of the observed facts than the free ether-wave theory, although it does not at present account for several phenomena encountered in practical work.

REPRINT No. 40 from the Bulletin of the Bureau of Standards at Washington consists of an account of some preliminary measurements of the temperature and selective radiation of the filaments of various kinds of incandescent electric lamps made by Messrs. C. W. Waidner and G. K.



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Burgess. They find that at temperatures about 1500° C. platinum departs farthest of all the substances tried from radiating as a perfectly black body, while carbon most nearly approximates to a black body. All the filaments used are thus selective radiators, and are more efficient luminous radiators than a black body, the order being for the same temperature—platinum, tantalum, tungsten, carbon. The superiority of tantalum and tungsten over carbon filament lamps is to some extent due to this fact, which is further emphasised by the higher temperature at which they can be worked, the light emitted varying nearly as the twelfth, while the energy supplied varies only as the fifth, power of the temperature.

THE Health Education League of Boston, Massachusetts, has sent us two copies of new booklets published in continuation of the series noticed in a recent number of NATURE (September 12, p. 508). In one of the booklets (No. 12) Dr. M. H. Bailey deals with "Emergencies," and in the other Miss A. F. Rogers and Dr. J. H. McCollom describe "Microbes: Good and Bad."

A SECOND edition of Prof. J. Reynolds Green's "Introduction to Vegetable Physiology" has just been published by Messrs. J. and A. Churchill. The price of the work is 10s. 6d. net.

A SECOND edition (third impression) of Mr. W. P. Workman's "School Arithmetic," which is a school course adapted from "The Tutorial Arithmetic," has been published by Mr. W. B. Clive.

WE have received from Mr. C. Baker, of High Holborn, London, the October issue of his classified list of second-hand instruments and of new pieces of apparatus recently introduced. The catalogue contains a description of more than a thousand pieces of apparatus, together valued at more than 6000*l*. Those who are contemplating the purchase of microscopes, telescopes, spectroscopes, and other physical apparatus would do well to examine this catalogue.

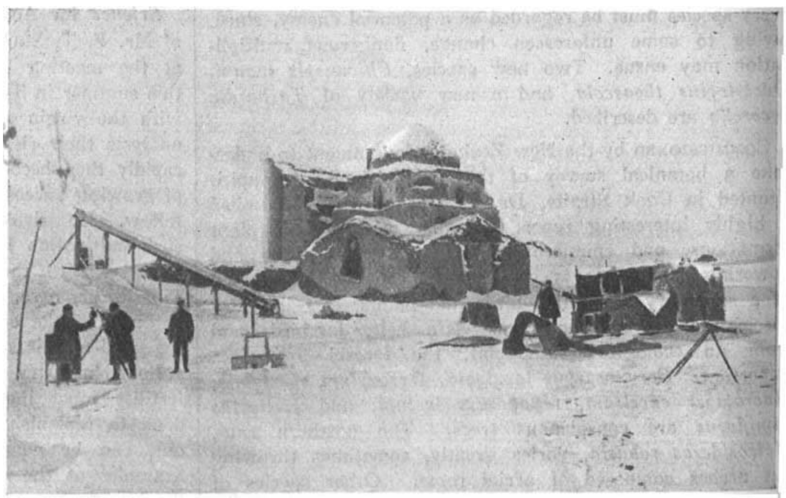
THE general committee of the Dr. Fream memorial fund has confirmed the following resolution, which was passed at a recent meeting and accepted by the Board of Agriculture and Fisheries:—"That the Fream Memorial Fund shall be invested in the name of the Board of Agriculture and Fisheries or of an official trustee selected by the Board, and shall be administered by the Board of Agriculture and Fisheries, and that the income shall be applied by way of a Fream memorial prize of books to be competed for in each year by students in the science of agriculture, and so that as long as an examination is held by the National Agricultural Examination Board for the national diploma in agriculture the prize shall be awarded to the person who obtains the highest marks in such examination." A sum of about 200*l*. is available for the purpose of the memorial.

PHOTOGRAPHERS will study with interest the new edition of the catalogue of photographic apparatus and materials recently issued by Messrs. Marion and Co., Ltd., of Soho Square, London. The full descriptions and carefully tabulated particulars as to sizes and prices contained in this well-illustrated list should render the choice of material easy and expeditious.

## OUR ASTRONOMICAL COLUMN.

THE PHYSICAL NATURE OF METEOR TRAINS.—An interesting discussion of the nature of meteor trains is published in No. 2, vol. xxvi. (p. 95, September), of the *Astrophysical Journal* by Prof. C. C. Trowbridge. Prof. Trowbridge, believing that valuable information concerning the upper layers of the earth's atmosphere may be thereby deduced, has compiled a catalogue of observed meteor trains, and for several years has made a comparative study of the data, at the same time making a study of the phenomena of gas phosphorescence. The discussion of altitudes leads to the conclusion that there is a definite layer of the earth's atmosphere, probably some fifty to sixty miles high, where the conditions are favourable to the production of the peculiar glow constituting a meteor train. Prof. Trowbridge believes that the secondary appearance of duality, so frequently observed in meteor trains, is due to the probable tubular form of the trains. The train itself is probably a tube of gas and particles of meteor dust, rendered phosphorescent by some temperature or electrical effect produced by the meteor's passage. The rate of diffusion and the colour of meteor trains agree with similar phenomena observed in phosphorescent air in the laboratory.

THE PULKOWA ECLIPSE EXPEDITION TO TURKESTAN, JANUARY, 1907.—An interesting account of the expedition dispatched from the Nicholas Central Observatory, Pulkowa, to observe the eclipse of January 13, 1907, is given in No. 18, vol. ii., of the *Mitteilungen der Nikolai-Haupsternwarte zu Pulkowo*. The site chosen for the observation of the eclipse was near the small town of Ura-tyube, in the Samarkand district of Turkestan, and there the various instruments were erected on December 31, 1906. The accompanying illustration, reproduced from the *Mitteilungen*, gives some idea of the conditions under which the observers worked, and shows the instruments in position. The long tube on the left is the coronagraph of 5 inches aperture and 43·5 feet focal length, with which M. Hansky hoped to obtain photographs showing details of the inner corona and prominences; as may be seen, this instrument was pointed directly to the sun's place at the moment of mid-totality. With the photographic refractor of short focus, it was planned to obtain five photographs of the corona with various coloured screens and on different plates. In addition to these, an attempt was to be made to photograph the spectrum of the corona from C to the ultra-violet, and M. Hansky also proposed to carry out photographic photometric researches.



Observing Station of the Eclipse Expedition at Ura-tyube, Russian Turkestan.

Heavy snowfall prevented this programme from being carried out on the day of the eclipse, but some interesting observations of the terrestrial colour effects and the shadow-bands were made. M. Hansky also discusses some



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